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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.
09/589,841	06/08/00	FARNWORTH	W 3923US (99-

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EXAMINER

LEE, G

ART UNIT

PAPER NUMBER

2825

DATE MAILED: 10/24/01

Please find below and/or attached an Office communication concerning this application or proceeding.

Commissioner of Patents and Trademarks

Office Action Summary

Application No.

09/589,841

Applicant(s)

FARNWORTH ET AL.

Examiner

Granvill D Lee, Jr

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 30 July 2001.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-56 is/are pending in the application.
- 4a) Of the above claim(s) 38-51 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-30 and 52-56 is/are rejected.
- 7) ☒ Claim(s) 31 and 32 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 5.

- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other:

DETAILED ACTION

Response to Election

The election thereby made, without traverse is herein clarified to prosecute claims 1-37 and 52-56 of Group I.

Specification

The disclosure is objected to because of the following informalities:

1. Page 22 line 15, item #51 is not depicted in figure 11, but is in figure 9.
2. Item #68 in figure 11 has not been discussed in the specification.

The lengthy specification has not been checked to the extent necessary to determine the presence of all possible minor errors. Applicant's cooperation is requested in correcting any errors of which applicant may become aware in the specification. Appropriate correction is required.

Claim Objections - 35 USC § 112

Claims 2, 18 and 35 are objected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

In view of claim 2 in using terms "unconsolidated state" and "liquid state" gives the impression that these states are different. Is that true? Explanation is required.

In claim 18, the dependency needs correction.

In claim 35, the phrase "for controlling said subjecting" is indefinite and correction is required.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-23, 33-37 and 52-56 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fjelstad (US Pat. 6,284,563) in view of Farnworth et al. (US Pat. 6,268,655) and in further view of Hull (US Pat. 4,575,330).

In regard to claims 1, 8, 12-13, 33, and 52, Fjelstad contains a method of fabricating a semiconductor chip package using a protective layer on a semiconductor device (Col. 3 lines 20-25), while providing at least one semiconductor die or multiple dies (Col. 8 lines 12-16), and having at least one bond pad (Fig. 2 #110). Further, Fjelstad (clms. 7 & 16-19) provides for a wafer with a plurality of semiconductor dice (Fig. 3 & Col. 8 lines 12-16), where the protective layer can be applied before or after dicing (Col. 19 lines 28-34). Furthermore, Fjelstad shows (clms. 20-21) that a liquid material can be applied where desired (Col. 11 lines 17-40), and that the protective layer used can be a thermoplastic polymer (Col. 9 lines 1-10), which is compressible (clms. 53-56) to receive components (Col. 9 lines 11-21). But, Fjelstad does not teach forming a silicon dioxide layer or a stereolithographic technique.

Among other things, Farnsworth et al. discloses (clms. 10-11 & 22) a process where the protective layer is formed over the bond pad (Col. 5 lines 15-20). But more importantly, Farnsworth et al. forms a protective silicon dioxide layer over the active surface (Fig. 2a #21) of each device of the wafer (Col. 4 lines 55-60), to protect key components. Therefore, it would have been obvious to a person of ordinary skill in the art at the time of the invention to modify the teachings of Fjelstad with those of Farnsworth with the expectation of achieving easier etching results. Because Farnsworth was interested in etching the protective layer, using silicon dioxide allowed both good protection and ease of selective etching (Col. 4 lines 55-60).

Still, neither Fjelstad nor Farnsworth et al. discloses a stereolithographic method by altering the state of the protective layer from a liquid to a semisolid over one portion, and leaving the layer a liquid over another portion.

But, Hull does disclose a stereolithographic computer programmed process where an ultraviolet light cures a liquid layer by converting it to a solid layer over any desirable object, where the speed of the process depends on the light intensity and the curable liquid (Col. 8 lines 9-14 and Col. 6 line 43-Col. 7 line 17). Furthermore, Hull shows that the apparatus has a platform and provides a resin bath for dipping the object in the curable liquid (Fig. 3 #23). Therefore, it would have been obvious to a person of ordinary skill in the art at the time of the invention to modify the teachings of Fjelstad and Farnsworth with those of Hull with the expectation of achieving a better layering results.

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Hull describes a process where thin, solid layers can be formed on a surface, that are thin enough to represent the object, but thick enough to be adhesive to objects or other layers (Col. 5 lines 29-50). Furthermore, the process is broad enough where uncured areas can be removed, as well (Col. 6 line 64-Col. 7 line 10).

In view of claim 2, Hull begins forming a first liquid layer over a surface and laminated with successive layers, which are liquid before the curing process (Col. 6 lines 6-19).

In viewing claim 3, Hull forms a first layer in a liquid state to have a thickness similar to the thickness of the layer before/after it, which is now a partially cured semisolid over any desired portion (Col. 6 line 63-Col. 7 line 10).

In view of claims 4-5, Hull depicts a controlled beam of ultraviolet radiation over a portion of material (Fig. 3 #27 & Col. 6 lines 43-63).

In view of claim 6, Hull suggests that a liquid resin can be cured to a solid resin (Col. 6 lines 43-47).

In view of claims 9 & 14, Hull states that the cured or partially cured material can be removed (Col. 7 line 1-10).

In view of claim 15, Hull depicts a laminar process of at least one layer (Col. 5 lines 5-25) of varied thickness.

In view of claim 23, Hull uses a UV beam of radiation to cure portions of the material (Col. 6 lines 7-13).

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In view of claim 34-37, Hull depicts a computer controlled 3-d process where the UV radiation cures a layer submerged in a bath and a layer formed thereby (Col. 6 lines 45-55). This entire process is stereolithographically done by said computer.

Claims 24-30 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fjelstad (US Pat. 6,284,563) in view of Farnworth et al. (US Pat. 6,268,655) and Hull (US Pat. 4,575,330) and in further view of of Kaldenberg (US Pat. 5,897,338).

In view of claim 24, and indicated above, Fjelstad contains a method of fabricating a semiconductor chip package using a protective layer on a semiconductor device, while providing at least one semiconductor die or multiple dies, having at least one bond pad, and the wafer can have a protective layer applied before or after dicing. Also indicated, is Farnworth et al. whom forms a protective silicon dioxide layer over the active surface of each device of the wafer, to protect key components. Lastly, Hull authors a stereolithography technique using a 3-d computer image.

However, neither inventor shows a process of making a layer over a semiconductor die with a lead frame component. But, Kaldenberg elaborates on a process of encapsulating a semiconductor circuit with a lead frame (Col. 1 lines 5-10). Therefore, it would have been obvious to a person of ordinary skill in the art at the time of the invention to modify the inventions of Fjelstad,

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Farnsworth et al. and Hull of with those of Kaldenberg the expectation of achieving better encapsulating results, because the process suggested by Kaldenberg will encapsulate the entire semiconductor circuit completely with the flexibility to encompass other devices (Col. 1 lines 5-35).

In view of claim 25, Hull uses a UV beam of radiation to cure portions of the material (Col. 6 lines 7-13).

In regard to claims 26-27, Hull uses a computer-controlled system generating 3-d view of the object, stereo lithographically.

In view of claims 28-29, Hull suggests that it is known in the art to exclude the lead frames (Col. 1 lines 17-24), if desired.

In view of claim 30, Hull states that the cured or partially cured material can be removed (Col. 7 line 1-10).

Allowable Subject Matter

Claims 31-32 objected to as being dependent upon a rejected base claim, but would be allowable (since no one layer is subjected to two cures) if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Contact Information

Any inquiry concerning this communication or earlier communications for the examiner should be directed to Granvill Lee whose telephone number is (703) 306-5865. The examiner can be

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normally reached on Monday thru Thursday from 7:00 am to 5:30 pm.

If attempts to reach the examiner by telephone are not successful, the examiner's supervisor, Matthew Smith can be reached on (703) 308-1323. The fax phone number for this group is (703) 308-7722.

Any inquiry of a general nature relating to status or otherwise should be directed to the receptionist whose telephone number is 703-308-1782.

Examiner
Granvill Lee
Art Unit 2825

Gl
10/15/01



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